

# Forest Health Protection Pacific Southwest Region



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To: District Ranger, Mt. Hough Ranger District, Plumas National Forest

Subject: Evaluation of the Snake Lake Proposed Equestrian Campground (FHP Report NE11-15)

At the request of Rachel Condon, Sales Administrator, Beckwourth Ranger District, Bill Woodruff, Forest Health Protection (FHP) Plant Pathologist and Danny Cluck, FHP Entomologist, conducted a field evaluation of the Snake Lake campground on August 24, 2011. The objective of the visit was to evaluate the current forest health conditions within and adjacent to existing and proposed campsites and to provide management recommendations as appropriate. These recommendations will assist in planning vegetation and hazard tree management for the area. Rachel Condon, Judy Schaber and Ryan Bauer from the USFS and Donnal Nichols and Diane Uchytel from the local equestrian club accompanied us in the field.

## Site information

The Snake Lake campground is located about 5 miles west of Quincy, CA at an elevation of 4000 feet (39° 58.5050"N and 121° 00.8798"W) with annual precipitation between 40 and 50 inches. Forest cover is comprised of dense Sierra Nevada mixed conifer with ponderosa pine (*Pinus ponderosa*), white fir (*Abies concolor*), Douglas-fir (*Pseudotsuga menziesii*), sugar pine (*Pinus lambertiana*), incense cedar (*Calocedrus decurrens*) and black oak (*Quercus kelloggii*). Ponderosa pine and Douglas-fir make up most of the overstory while the understory consists of sapling and pole sized white fir and a few black oak seedlings and saplings. Plans for this campground include improvements to existing campsites and the establishment of a new loop

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with pull-through campsites suitable for horse trailers. Small horse corrals will also be constructed near some campsites. The District plans to cut and remove up to 8" dbh trees throughout the campground to reduce fuels. Larger diameter trees that are deemed hazards will also be cut and removed.

Forest conditions within this campground were previously evaluated by Rachel Condon. Her excellent report, which included many photos of stand conditions and potential hazard trees, captured many of the forest health issues that are presented below, including the need to reduce stocking levels throughout the campground area.

### **Forest insect and disease conditions**

Several high density pockets of larger diameter (>20" dbh) ponderosa pine are located within campground that are stocked at levels considered high risk to western pine beetle (*Dendroctonus brevicomis*) attacks and subsequent mortality. One small group of western pine beetle caused mortality was observed near the new restroom.

Several trees were observed with basal injuries caused by passing vehicles along the main unimproved campground road.

Conks of *Phellinus pini*, the fungus that causes red ring rot, were observed in Douglas-fir and ponderosa pine.

A conk of the decay fungus *Phaeolus schweinitzii* was observed in one large Douglas-fir near the road.

White pine blister rust (*Cronartium ribicola*) was observed in a few sugar pines causing branch flagging.

Most of the larger black oaks have extensive bole decay probably caused by the decay fungus *Phellinus robustus*.

Many overstory black oaks showed moderate defoliation suspected to be caused by the black oak leaf mining moth, *Eriocraniella aurosarsella*.

Bacterial galls were observed on a couple of Douglas fir and western dwarf mistletoe (*Arceuthobium campylopodum*) was observed on a few ponderosa pines.

### **Considerations for the Snake Lake Campground Renovation**

Trees in the Snake Lake campgrounds, like most forested campgrounds, are exposed to additional stress factors that can compromise their health and vigor. Firewood collecting sometimes leads to tree wounding from hatchets and saws. Carving and chopping trunks can cause extensive cambium damage. Foot and vehicle traffic compacts soil and can damage roots.

Posting public information signs at campground entrances may help increase awareness of the human impact on campground trees.

Soil compaction can predispose conifers to bark beetle attacks and subsequent mortality. Compaction can reduce the water holding capacity of the soil and suffocate roots, which limits the available oxygen that is necessary for root growth and survival. Damaged and unhealthy roots cannot provide the upper portions of the tree with the water and nutrients it requires to maintain its natural defenses. Soil compaction and associated root injury are long-term problems that may not reveal themselves until several years after the damage has occurred. In order to minimize future soil compaction and root damage, campers should be directed to specific travel corridors from campsites to restrooms, water sources, and specific recreation areas. It is especially important to divert and limit foot and vehicle travel and keep excavation for roads, trails and utilities away from the root zones of trees.

High stand density also plays a role in predisposing trees to bark beetle attacks. Excessive competition for limited water and nutrients puts stress on individual trees and reduces their ability to maintain an adequate defense system. Overstocked stand conditions may persist over time with limited bark beetle caused mortality until triggered by drought or other factors. Bark beetle caused mortality within a campground can result in a dramatic reduction in stocking, especially in the larger size classes, and an increase in the number of hazard trees that must be removed.

To increase tree health and vigor and reduce the risk of future bark beetle caused tree mortality, stands should be thinned to a basal area appropriate for the site. When determining the carrying capacity of the site the effects of soil compaction should be considered as site quality may be reduced. In addition, where compaction exists, trees may not respond as expected after thinning treatments. In general, to reduce the susceptibility to future bark beetle caused tree mortality, stands should be thinned to densities that are 80% or less of “normal” basal area, effectively reducing tree competition for limited water and nutrients. Furthermore, selecting for more drought tolerant species such as ponderosa pine, sugar pine, incense cedar, Douglas-fir (if free of disease) and black oak for retention will make the stand more resilient to insects and disease. For black oak retention, preference should be given to older trees with limited decay and younger, decay free trees. Any tree with extensive decay that is within striking distance of a target should be removed.

When planning thinning treatments, it should be recognized that the target stocking level is an average to be applied across the landscape and some variability may be desired. Individual high value trees, such as mature pine, as well as pure stands of younger ponderosa should benefit by having the stocking around them reduced to lower levels. In addition, thinning can decrease the need to enter stands to conduct salvage operations, decrease the amount of fuel loading and reduce the number of hazard trees. For any thinning operation, trees infected by decay fungi should be carefully evaluated to determine their structural integrity with those deemed hazardous removed.

Ponderosa pine growing in this area is at a much higher risk to bark beetle caused mortality than the other conifers due to its abundance within the stand. There is also a history of western pine

beetle activity in similar low elevation west side Sierra Nevada forests during periods of drought. Therefore, ponderosa pine should be given special consideration when planning thinning treatments to reduce its susceptibility to successful western pine beetle attacks. Risk could be decreased by reducing density to lower levels in ponderosa pine dominated pockets than what is appropriate for surrounding mixed conifer stands and/or by removing more ponderosa pines from these pockets in favor of retaining other tree species to increase diversity. The current plan to thin trees up to 8" dbh will not achieve the desired stocking level. Therefore, the District should consider other options to reduce the density of larger diameter ponderosa pines.

It is important to know that when cutting trees in recreation areas, all conifer stumps greater than 3" in diameter must be treated with a registered borate compound (FSM R5 Supplement 2300-92-1 modified by FSH R5 Supplement 3409.11-2010-1) to reduce the probability of infection by *Heterobasidion occidentale* and *H. irregulare*. The causal agents of heterobasidion root disease (formerly referred to as annosus root disease).

The other insects and diseases observed during this visit, such as white pine blister rust and the black oak leaf miner, are not occurring at levels that should cause concern or change the direction of the project.

### **Hazard tree management for campgrounds**

Despite the effectiveness of any long or short-term plans to prevent tree injury and mortality, some trees, through declining health, will eventually become hazards to the public. To minimize the risks, hazard trees should be identified and removed before they fail. The current practice for many National Forest campgrounds is to remove trees as they die. This eliminates the risk from dead trees but fails to address living trees that are infected with root disease, heart rot, and/or have a structural defect (many of these were observed within the campground area). These high-risk green trees are equally hazardous and should not be overlooked. Therefore, it is recommended that the Forest develop a hazard tree evaluation and monitoring plan for these recreation areas. At your request, Forest Health Protection can provide information and assist with the development of such a plan. In the short-term, trees within the Snake Lake campground, and within striking distance of a target, that have obvious stem decay, dead tops and/or large dead branches should be carefully evaluated and hazards removed or pruned as soon as possible. All standing dead trees within striking distance of any target should be removed immediately.

### **General recommendations for campground renovation**

Maintaining and promoting healthy trees are important objectives for development plans in campgrounds. Care should be taken during future campsite, trail and facility construction to minimize negative impacts on the landscape. The following guidelines should be applied for areas under construction or in areas where future construction will take place.

- Tree density should be appropriate for the site. This will provide access to sunlight, moisture and nutrients and allow the trees to better cope with their altered environment.

- Trees that will directly interfere with structures or that will be seriously damaged during construction or excavation should be removed.
- Leave a mixture of tree species and ages to provide a continual forest canopy over the years.
- Fence off individual or groups of trees during construction to negate or minimize root damage by soil compaction or trunk and root damage by equipment. Protective fences should be placed, at a minimum, at drip line. Depending on the species, tree roots can exist within a radius two times the crown radius and encompass an area well beyond drip line. Drip line is defined by the outer edge of the foliage. Penalties for damaging trees should be incorporated into tree removal or construction contracts.
- Road or natural landscape grades should be changed as little as possible. Grading damages roots and can set up conditions that favor soil erosion. It can also alter the contour such that the flow of surface and subsurface water is drastically affected.
- Trenches should always be dug away from tree roots.
- Do not back fill with earth or rocks around the trunks of trees.
- Avoid paving with either concrete or asphalt over root systems, or close to the trunks of trees.
- Use caution in applying wood preservatives and other chemicals to buildings and other structures. Trees and other plants have been killed by direct contact with these chemicals or as a result of chemicals in rainwater runoff.
- Avoid leaving green pine slash on site to prevent the buildup of pine engraver (*Ips pini*) beetle populations that may attack standing green trees.

Future construction or vegetation management activities that incorporate the above guidelines will help assure the existence of vigorous and healthy trees following project completion.

If you have any questions regarding this report and/or need additional information please call 530-252-6431 or email [dcluck@fs.fed.us](mailto:dcluck@fs.fed.us).

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